WHAT IS CLAIMED IS:

1. A biomagnetic measurement apparatus comprising means detecting a magnetic field produced from a heart, means calculating current vectors from said detected magnetic field, means calculating a potential waveform corresponding to a ventricular muscle cell action potential based on the change of absolute values of said current vectors with time, and means displaying said potential waveform.

2. The biomagnetic measurement apparatus according to claim 1, wherein said magnetic fields are detected at a plurality of different measurement points, said current vectors are calculated at said plurality of measurement points, and said potential waveforms obtained based on the change of the absolute values of said current vectors with time are displayed.

3. The biomagnetic measurement apparatus according to claim 1, wherein in said means calculating a potential waveform, said potential waveform is calculated by adding the absolute values of said current vectors in a period from start time of depolarization of the heart to end time of depolarization of the heart, and it is calculated by subtracting the absolute values of said current vectors from the value of said potential waveform at the end of depolarization of the heart in a period from the end of depolarization of the heart to end time of repolarization of the heart.

4. The biomagnetic measurement apparatus according to claim 1, wherein said means displaying a potential waveform displays the waveform of said measured magnetic field and said potential waveform at the same time.

5. A biomagnetic measurement apparatus comprising a plurality of detection coils detecting, when a plane in parallel with a plane contacted with a living body is xy plane and an axis vertical to said (x, y) plane is z, element Bz in z direction of a magnetic field produced from said living body at a plurality of measurement points (x, y), a data collection device collecting detected signal data of the element Bz in said z direction, an operation processor performing operation processing of said collected signal data, and a display device displaying the result of said operation processing, wherein said operation processor executes first operation processing in which when $t = t_i$ ($i = 0, 1, \ldots, m$) is a period corresponding to depolarization of the heart of said living body and $t = t_i$ ($i = m+1, m+2, \ldots, n$) is a period corresponding to repolarization of the heart of said living body, from the element Bz in said z direction at time $t = t_i$ ($i = 0, 1, \ldots, n$) at said measurement point (x, y), a current vector (Ix (t), Iy (t)) and an absolute value of said current vector $Ixy\ (t) = \sqrt{\{(Ix\ (t))^2 + (Iy\ (t)^2)\}}$ are calculated, second operation processing in which when the lower limit of addition $\Sigma$ is $i = 0$ and the upper

limit of addition $\Sigma$ is i = 0, 1, ..., m, a potential waveform in a period corresponding to depolarization of the heart of said living body is calculated by using V $(t_i) = \Sigma Ixy\ (t_i)$, and third operation processing in which when the value of said potential waveform V $(t_m)$ at the end of a period corresponding to depolarization of the heart of said living body is $V_m$, the lower limit of addition $\Sigma$ is i = m+1 and the upper limit of addition $\Sigma$ is i = m+1, m+2, ..., n, a potential waveform in a period corresponding to repolarization of the heart of said living body is calculated by using V $(t_i) = V_m - \Sigma Ixy\ (t_i)$, and said display device displays said potential waveform corresponding to said measurement point (x, y) obtained by said second and said third operation processing.

6. The biomagnetic measurement apparatus according to claim 5, wherein said potential waveforms V are calculated at said plurality of measurement points.

7. The biomagnetic measurement apparatus according to claim 6, wherein said display device displays the waveforms of said measured magnetic fields and said potential waveforms V.

8. The biomagnetic measurement apparatus according to claim 6, wherein said display device performs contour map display of said potential waveforms V.

9. A biomagnetic measurement apparatus in which

when a plane in parallel with a plane contacted with the surface of a chest is xy plane and an axis vertical to said x, y plane is z, magnetic fields produced from a heart are detected at a plurality of measurement points (x, y) to calculate current vectors from said detected magnetic fields, wherein when start time of depolarization of the heart is $t_0$, end time of depolarization of the heart is $t_m$, end time of repolarization of the heart is $t_n$, an absolute value of said current vector at time $t_i$ is Ixy ($t_i$) (i = 1, 2, ..., n), and a potential waveform at said time $t_0$ is V ($t_0$) = 0, a potential waveform at time $t_i$ in a period from said time $t_0$ to said time $t_m$ is calculated by using V ($t_i$) = V (t i-1) + Ixy ($t_i$), the value of potential waveform V ($t_m$) at said time $t_m$ is $V_m$, a potential waveform at said time $t_{m+1}$ is calculated by using V ($t_{m+1}$) = $V_m$ - Ixy ($t_{m+1}$), a potential waveform at time $t_i$ in a period from time $t_{m+2}$ to time $t_n$ is calculated by using V ($t_i$) = V (t i-1) - Ixy ($t_i$), and said potential waveform V ($t_i$) is calculated at said measurement point (x, y), and said potential waveform is displayed.

10. The biomagnetic measurement apparatus according to claim 9, wherein said potential waveforms corresponding to said plurality of measurement points (x, y) are displayed at the same time.

11. A biomagnetic measurement apparatus in which when a plane in parallel with a plane contacted with the surface of a chest is xy plane and an axis

vertical to said xy plane is z, magnetic fields produced from a heart are detected at a plurality of measurement points (x, y) to calculate current vectors, wherein in a period from start time of depolarization of the heart to end time of depolarization of the heart, absolute values of said current vectors are added to calculate a potential waveform, and in a period from the end of depolarization of the heart to end time of repolarization of the heart, the absolute values of said current vectors are subtracted from the value of said potential waveform at the end of depolarization of the heart to calculate said potential waveform at said measurement point (x, y) to display said potential waveform.

12. A biomagnetic measurement apparatus which detects a magnetic field produced from a heart to calculate current vectors, further comprising a display device displaying a potential waveform corresponding to a ventricular muscle cell action potential obtained based on the change of the absolute values of said current vectors with time.

13. The biomagnetic measurement apparatus according to claim 12, wherein said magnetic fields are detected at a plurality of measurement points, said current vectors are calculated at said plurality of measurement points, and said potential waveforms obtained based on the change of the absolute values of said current vectors with time are displayed on said

display device.

14. The biomagnetic measurement apparatus according to claim 12, wherein in a period from start time of depolarization of the heart to end time of depolarization of the heart, said potential waveform is calculated by adding absolute values of said current vectors, and in a period from the end of depolarization of the heart to end time of repolarization of the heart, it is calculated by subtracting the absolute values of said current vectors from the value of said potential waveform at the end of depolarization of the heart.

15. The biomagnetic measurement apparatus according to claim 12, wherein said display device displays the potential waveform of said measured magnetic field and said potential waveform at the same time.

16. A biomagnetic measurement apparatus in which when a plane in parallel with a plane contacted with the surface of a chest is xy plane and an axis vertical to said xy plane is z, magnetic fields produced from a heart are detected at a plurality of measurement points (x, y) to calculate current vectors from said detected magnetic fields, further comprising a display device displaying a potential waveform corresponding to a ventricular muscle cell action potential calculated from the absolute value of said current vector at said measurement point (x, y).

17. The biomagnetic measurement apparatus

according to claim 16, wherein said display device displays the waveform of said magnetic field measured at said measurement point and said potential waveform at the same time.